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AMSAT NEWS SERVICE
ANS-255

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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SB SAT @ AMSAT $ANS-255.01
ANS-255 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 255.01
 >From AMSAT HQ KENSINGTON, MD.
DATE September 11, 2016
To All RADIO AMATEURS
BID: $ANS-255.01

RadFxSat (Fox-1B) launch date is now scheduled for March 16, 2017

The RadFxSat (Fox-1B) launch date has been moved, and is now scheduled for March 16, 2017.

RadFxSat will ride as one of the ELaNa XIV secondary payloads aboard the NASA JPSS-1 launch on a ULA Delta II rocket.

The launch will be at Vandenberg AFB, California. It is one of only two remaining Delta II planned to be launched.

The RadFxSat mission is a partnership with Vanderbilt Institute for Space and Defense Electronics (ISDE) that will study space radiation effects on commercial off the shelf memory. The experiments are carried aboard the AMSAT Fox-1B CubeSat and experiment data will be carried in the subaudible telemetry stream of the Fox-1B FM repeater along with the CubeSat telemetry data. The telemetry can be decoded and displayed with the AMSAT FoxTelem software.

[ANS thanks Jerry Buxton, N0JY AMSAT Vice President, Engineering for the above information]

AMSAT-NA Board of Directors Ballots Due by September 15th

Ballots have been mailed to AMSAT-NA members in good standing, and must be returned to the AMSAT-NA office by September 15, 2016 in order to be counted. Those sent outside North America were sent by air mail. If you have not received your ballot package in a reasonable time for your QTH, please contact the AMSAT-NA office. Your completed ballot should be sent as promptly as possible, and those from outside North American preferably by air mail or other expedited means.

This year there are five candidates:

Tom Clark, K3IO
Clayton Coleman, W5PFG
Mark Hammond, N8MH
Bruce Paige, KK5DO
Paul Stoetzer, N8HM

The three candidates receiving the highest number of votes will be seated as voting Board Members with two year terms. The two candidates receiving the next highest number of votes will be non-voting Alternate Board Members with terms of one year. Please vote for no more than three candidates.

Please take the time to review the candidate statements that accompany the ballot and determine who you wish to see on the Board. Election of Board members is both an obligation as well as an opportunity by our membership to help shape the future direction of AMSAT-NA.

[ANS thanks AMSAT-NA for the above information]

AMSAT Awards Update

Congrats to all who have earned an AMSAT Award since the last posting.

AMSAT Satellite Communicators Award for making their first satellite QSO
Peter Laws, N5UWY
Jose de Jesus Moura Costa, PS8E
Mac Cody, AE5PH
Bernard Van Haecke, KI6TSF

Burns Fisher, W2BFJ

AMSAT Communications Achievement Award
Robert Beatty, WB4SON #569

AMSAT Sexagesimal Award
Fernando Ramirez-Ferrer, NP4JV #173

AMSAT Century Club Award
Kevin Manzer, N4UFO #47

AMSAT Robert W. Barbee Jr., W4AMI Award
Yanko Yankov, NX9G #87 1000+

To see all the awards visit http://www.amsat.org or
http://www.amsatnet.com/awards.html

[ANS thanks Bruce Paige, KK5DO, AMSAT Director Contests and Awards
for the above information]

“Frequency Crunch” is ARRL/TAPR Digital Communications Conference
Sunday Seminar Topic

“Spectrum (It’s the frequency crunch for real)” will be the Sunday Seminar
topic at the ARRL/TAPR Digital Communications Conference (DCC) September
16-18
in St Petersburg, Florida. Michelle Thompson, W5NYV, and Bob McGwier, N4HY,
will moderate the tutorial.

“The Amateur Radio spectrum above 450 MHz is facing serious threats. The
demand for useful spectrum is large and growing,” an abstract for the
presentation asserts. “We will explain why this spectrum is in demand
and what
you need to know and do in order to defend it.”

The presentation will offer a practical understanding of digital
communication, software-defined radio, codecs, protocols, and cognitive
radio.
Thompson heads the AMSAT Ground Terminal Team, a component of the so-called
“five and dime (5 GHz and 10 GHz) Phase 4B geosynchronous satellite project.
McGwier is chief scientist at the Hume Center for National Security and
Technology at Virginia Tech.

The Saturday night banquet speaker will be ARRL Chief Technology Officer
Brennan Price, N4QX. His topic will be “New Frontiers in Wireless:
Challenges
to and Opportunities for Amateur Radio.”

http://www.arrl.org/news/frequency-crunch-is-arrl-tapr-digital-communications-
conference-sunday-seminar-topic

[ANS thanks TAPR and the ARRL for the above information]

2016 AMSAT Space Symposium Registration Reminder

- Booking your Carnival Cruise does not register you for the AMSAT Symposium. There is a charge for each Symposium attendee of $40. This fee applies to those who will attend the technical presentations only and includes a copy of the printed Proceedings. Additional guests are entitled to attend all other events. The registration form is available from the AMSAT office or store website. Online Symposium registration:

http://store.amsat.org/catalog/product_info.php?products_id=130

- Ground transportation options have been added to the FAQ page on the AMSAT Symposium web page. Carnival offers round-trip transportation from HOU airport to the cruise terminal at approximately $74 per person, IAH airport $94 per person. If you are traveling to the Board of Directors meeting, you may still utilize the Carnival transportation option for your return to the airport from the cruise terminal. However, you will need to obtain other transportation between the airport and the Galveston DoubleTree hotel.

Cruise information may be found at:
http://www.amsat.org/?page_id=3667

[ANS thanks 2016 AMSAT Space Symposium Committee for the above information]

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5 Teams Share First Round of NASA Cube Quest Challenge Prizes

Five teams, ranging from university students to a group of engineers dispersed across the country, received $20,000 each from NASA in the first milestone of a competition to develop deep space CubeSat technologies.

The teams, announced by NASA at a Sept. 9 briefing, had the highest scores in the first of four “ground tournaments” that make up the initial phase of the agency’s $5 million Cube Quest Challenge. That tournament, held in early August, featured 13 teams who presented their initial spacecraft designs.

“Cube Quest is an opportunity for non-government CubeSat developers and builders to compete in lunar orbit and deep space for accomplishments in communications, navigation and longevity,” said Jim Cockrell of NASA’s Ames Research Center. Cockrell is manager of the competition, part of the agency’s Centennial Challenges prize program.
- See more at:
http://spacenews.com/5-teams-share-first-round-of-nasa-cubesat-prizes/#sthash.qbwJKlXB.dpuf
The ground tournaments are optional elements of the overall competition, intended to guide teams through the development of their spacecraft as they mature from initial concepts to flight hardware. Participating teams are scored

on how well they meet the requirements of each tournament, and the three with
the highest cumulative scores will win flights of their spacecraft as secondary
payloads on the first Space Launch System mission, Exploration Mission 1 (EM-
1), in 2018.

The first ground tournament did not involve any hardware, and Cockrell likened
it to a mission concept review that takes place early in the development of a
typical NASA mission. Judges assessed the capabilities of each proposed mission
and compliance with mission rules and SLS safety requirements.

“It was the first opportunity for teams to present their concepts for how they
intend to win the Cube Quest Challenge,” he said. “Ground Tournament 1
demonstrates that teams are on a good trajectory for launch on EM-1.”

Some of the winning teams are linked to universities that have experience with
CubeSats. A space systems design class at the Massachusetts Institute of
Technology started work on the KitCube spacecraft this spring, said Kerri
Cahoy, a professor of aeronautics and astronautics there. KitCube is designed
to go into lunar orbit and demonstrate a laser communications system.

Another team, Cislunar Explorers, is composed mostly of students at Cornell
University. “The work represents the culmination of lots of Ph.D.-level
research and some undergraduate research from the last five or six years at the
university,” said Mason Peck, a Cornell engineering professor who served as
NASA chief technologist from 2011 to 2013.

Peck said their spacecraft will demonstrate several key technologies,
including a propulsion system that uses solar power to convert water into
hydrogen and oxygen propellants. “It’s a pathfinder for the sustainable
exploration and settlement of the solar system,” he said.

Other winning teams have less traditional backgrounds. “There’s 12 of us
across the United States” working on Team Miles, said team leader Wes Faler.
Many of them are located in Tampa, Florida, including Faler, but others are
based in California, New York and South Carolina.

Faler said the team takes its name from a line in a Robert Frost poem: “And
miles to go before I sleep.” After going into orbit around the Moon, he said,
the spacecraft will perform an extended mission, traveling towards Mars to test
autonomous navigation technology.

Ragnarok Industries of Wilmington, Delaware, was established by a group of
former engineering interns at NASA’s Goddard Space Flight Center. Their
satellite, Heimdallr, is intended to test advanced propulsion and
communications technologies for missions beyond Earth orbit, said company co-
founder Luigi Balarinni.

Novel Engineering of Cocoa Beach, Florida, is working with several other local
companies, including Craig Technologies and Harris Corp., the latter providing

a deployable mesh antenna for its CubeSat, named Space Pig. The name, team members said, came from elementary school students during an outreach event.

The ultimate goal of the competition is to fly CubeSats into lunar orbit or deep space. A total of $3 million is offered in prizes for the “Lunar Derby” part of the competition, for both being able to enter lunar orbit and to demonstrate communications capabilities and longevity. An additional $1.5 million is for a “Deep Space Derby” to achieve communications and longevity goals.

NASA’s Cockrell said the next ground tournament is scheduled for early 2016. Teams can participate in that round, which he compared to a preliminary design
review, regardless of their performance, or even participation, in the August
tournament.

Teams that do not participate in the ground tournaments, or who do not finish
in the top three in total points, can still pursue the deep space and lunar prizes by arranging their own launches. The competition ends, and any prizes awarded, one year after the EM-1 launch
- See more at:
http://spacenews.com/5-teams-share-first-round-of-nasa-cubesat-prizes/#sthash.qbwJKlXB.dpuf

AMSAT-NA is partnered with the Ragnarok Industries team. Heimdallr satellite plans to test advanced propulsion and communications technologies for missions beyond Earth. AMSAT radio will be aboard. The AMSAT Groundstation
initiative will give amateur radio operators to uplink and downlink to the lunar satellite.

http://spacenews.com/5-teams-share-first-round-of-nasa-cubesat-prizes/

[ANS thanks www.spacenews.com for the above information]

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5 GHz to 10 GHz Lunar Transponder Mission

AMSAT-NA plans 5 GHz to 10 GHz transponders on a spacecraft expected to launch
in September 2018 into a Lunar orbit.

Heimdallr is a 3 axis stabilized 6U CubeSat with a mass of approximately 8 kg.
It will have a Cold Gas Thruster for inertia dump and a star tracker for navigation. Deployable, gimbled solar panels will produce up to 100 watts of DC
power, electric propulsion will be used to achieve lunar orbit.

There will be a combination of omni and directional patch antennas on one side
of spacecraft.

The first part of mission is to provide Telemetry, Tracking, and Command (TT&C) to obtain lunar orbit. The second part is to perform the data downlink
experiment while the final part is to provide a two way regenerative

repeater
and analog repeater in lunar orbit for lifetime of satellite.

Proposing these downlinks:
• Omni transponder: 10.451 GHz +/- 0.5 MHz
• Directional transponder: 10.4575 GHz. +/- 3.5 MHz
• Analog transponder: 10.4665 GHz. +/- 2.0 MHz

For the first part of the mission (TT&C) using 300 bps BPSK 1/2 rate viterbi
Ranging 1.5 Mbps BPSK DSSS. For the second part of mission 4.5 Mbps QPSK ½
rate DVB-S2. For the final part of mission 25 kbps BPSK 1/5 rate DVB-S2.

Proposing these Uplinks
• Omni transponder: 5.651 GHz +/- 0.5 MHz
• Directional transponder: 5.6575 GHz. +/- 3.5 MHz
• Analog transponder: 5.665 GHz. +/- 2 MHz

A link budget is available at
https://drive.google.com/folderview?id=0B3u-mSOWBMISYnZyZGJpeThKeU0&usp=sharing

It is anticipated that a 1 or 2 metre dish will be required using the AMSAT
designed ground station equipment.

Source IARU Satellite Frequency Coordination Status pages
http://www.amsat.org.uk/iaru/

[ANS thanks AMSAT-UK and the IARU for the above information]

Pratham: IITB Student Satellite

The satellite Pratham, built by students at the Indian Institute of
Technology
Bombay, is expected to launch on the Indian PSLV-C35 mission currently
planned
for September 26, 2016.

Pratham, a 300x300x300mm satellite with a mass of 10 kg, aims to measure
total
electron count in a 800 km altitude Sun Synchronous Orbit (SSO).

Aayush Yadav of the Pratham team writes:

We, students of IIT Bombay, are glad to inform you that our project,
Pratham,
is ready and expected to launch with PSLV-C35 in the last week of
September. We
would be really happy if you all joined us in receiving our satellite’s
beacon, details given below:

Beacon:
Mode: CW
wpm: 35 words
Frequency: 145.980 MHz
(The CW beacon will be on through out the orbit and can be received from
anywhere.)

Downlink:
Mode: FSK

Baudrate: 1200 bps
Frequency: 437.455 MHz
(To be switched on over France and India only)

We will update the information as soon as TLE's will be available.

Further information at
http://www.aero.iitb.ac.in/pratham/

Facebook
https://www.facebook.com/iitb.student.satellite/

[ANS thanks AMSAT-UK and Team Pratham for the above information]

Inspiring the next STEM generation

The UK Space Agency's Astronaut Flight Education Program Support Manager Susan Buckle will be giving a presentation at the RSGB Convention on Saturday,
October 8.

Along with Ciaran Morgan M0XTD, she will talk about the ten UK ARISS amateur radio school contacts with astronaut Tim Peake GB1SS during his Principia mission on the International Space Station.

These contacts have inspired thousands of young people and introduced them to
amateur radio in a new and exciting way.

The full schedule and booking information for the convention are available at
http://rsgb.org/convention Twitter hashtag #RSGBconv2016

An RSGB video celebrates these historic school contacts and the range of linked activities the schools have enjoyed.

Beginning with the exhilaration of the launch, it follows the competition for
schools to host the ARISS contacts, and showcases the variety of science, technology, engineering, maths (STEM) and arts activities that helped pupils to
understand more about space and amateur radio.

The contacts themselves, often led by newly-licensed pupils, were the successful culmination of many months of work and anticipation.

ARISS Principia
https://principia.ariss.org/

AMSAT-UK Article
https://amsat-uk.org/2016/09/10/inspiring-the-next-stem-generation/

[ANS thanks AMSAT-UK for the above information]

ARISS to Host On-line Information Sessions - School Contacts

To help organizations learn about ARISS radio contacts and the proposal process, ARISS offers one-hour online information sessions; all questions are welcomed. Attending an online session is not required but strongly encouraged.

Informational sessions will be offered Sept. 20, 2016, at 4 p.m. EDT and Sept. 28, 2016, at 7 p.m. EDT.

Advance registration is necessary. Email ARISS (ariss(a)arrl.org) to sign up for an information session.

For proposal information and more details such as expectations, proposal guidelines and proposal form, visit: http://www.arrl.org/hosting-an-ariss-contact.

ARISS Contact Application Window Open Until November 1

ARISS-US is now accepting proposals from U.S. schools, museums, science centers and community youth organizations (working individually or together) to host an Amateur Radio on the International Space Station, or ARISS, radio contact with an orbiting space station crew member between July 1 and Dec. 31, 2017. Proposals are due Nov. 1, 2016.

ARISS is looking for organizations that will draw large numbers of parti-cipants and integrate the contact into a well-developed education plan. Students can learn about satellite communications, wireless technology, science research conducted on the space station, what it is like to work in space, radio science, and any related STEM subject. Students learn to use amateur radio to talk directly to an astronaut and ask their STEM-related questions. ARISS will help educational organizations locate amateur radio groups who can assist with equipment for this once-in-a-lifetime
opportunity for students. Exact dates for the 10-minute radio contact are determined by crew scheduling and space station orbits.

ARISS-US is offered through a partnership between NASA; the American Radio Relay League, or ARRL; and the Radio Amateur Satellite Corporation, or AMSAT.

ARISS was created and is managed by an international working group.

Please email questions about this opportunity to ariss(a)arrl.org.

[ANS thanks NASA Education Express Message -- Sept. 8, 2016 for the above information]

AMSAT Events

Information about AMSAT activities at other important events around the country. Examples of these events are radio club meetings where AMSAT Area Coordinators give presentations, demonstrations of working amateur satellites, and hamfests with an AMSAT presence (a table with AMSAT literature and merchandise, sometimes also with presentations,

forums, and/or demonstrations).

*Saturday and Sunday, 10-11 September 2016 Boxboro Hamfest in Boxborough, MA (ARRL New England Division Convention)

*Friday, 23 September 2016 – presentation at Jet Propulsion Laboratory Amateur Radio Club in Pasadena CA

*Friday and Saturday, 21-22 October 2016 – CopaFest 2016, south of Maricopa AZ

*Saturday, 12 November 2016 – Oro Valley Amateur Radio Club Hamfest in Marana AZ

*Saturday, 3 December 2016 – Superstition Superfest in Mesa AZ

*Saturday, 14 January 2017 – Thunderbird Hamfest 2017 in Phoenix AZ

*Saturday, 4 February 2017 – Palm Springs Hamfest in Palm Springs CA

*Friday-Sunday, 10-12 February 2017 Orlando HamCation in Orlando, FL

*Friday and Saturday, 17-18 February 2017 – Yuma Hamfest in Yuma AZ

[ANS thanks AMSAT-NA for the above information]

ARISS News

Successful Contacts

* Lawrence Public Library, Lawrence KS, direct via KCØNFL
The ISS callsign was NA1SS
The scheduled astronaut was Takuya Onishi KF5LKS
Contact was Successful: Sat 2016-09-10 17:03:42 UTC

13 Questions Asked/Answered
300 People at the library, 91 watched the livestream online
The event was covered by local Channel 6 News, KUJH (KU's tv channel), Girl Scouts (for their blog), and The Lawrence Journal World.

* Lewis and Clark National Historical Park, Astoria OR,
was direct via KF7TCG now telebridge via W6SRJ
The ISS callsign was NA1SS
The scheduled astronaut was Kate Rubins KG5FYJ
Contact was Successful: Sat 2016-09-10 17:03:19 UTC via W6SRJ

17 of 20 questions Asked/Answered.
Approximately 50 in audience.

Upcoming Contacts

* C.E.PR. Almadén, Jaén, Spain, direct via EA7URJ or TBD
The ISS callsign is presently scheduled to be OR4ISS
The scheduled astronaut is Kate Rubins KG5FYJ
Contact is a go for: Thu 2016-09-15 08:14:19 UTC

Watch
http://www.ariss.org/upcoming-contacts.html
for information about upcoming contacts as they are scheduled.

[ANS thanks ARISS, Dave, AA4KN, and Charlie, AJ9N for the above information]

Satellite Shorts From All Over

K6R Coundtdown

On September 16th, Wyatt, AC0RA, and myself will be getting on the boat in Ventura, CA with our destination set on CM93. We've been training all summer, finalizing equipment, setting skeds, and generally getting all the loose ends tied up, and we look to be ready to go.

We have posted our Final pass schedule on the K6R QRZ page at
https://www.qrz.com/lookup/K6R
- so feel free to find a pass that is to your liking. We have tried hard to include everyone in our distance range on at least 1 or 2 passes. Of course all passes are dependent on weather, schedule, and other factors - and there's
a very good chance we'll show up on passes that AREN'T on our list as well..
find a window, and see if we're around.

We're also happy to announce that Jimmy, KK6FAH will be serving as our pilot relay station for the expedition. He's a fellow AMSAT operator, and has a QTH right in Ventura, and we should be in local repeater range of each other while we're on the Island. We have agreed to meet up each evening and report our logs to him, and he will then pass our report on to the BB. Please do not email him with questions about busted calls or the like, he's simply going to be passing on our reports. He's also been awesome in helping us with some local arrangements, and we appreciate his assistance with this project greatly.

I'd also like to make a brief request for folks to use some good situational awareness while we're out there. We know this is a rare grid and there's tons of interest, but remember that the birds and pass time are a scarce resource. We're hoping with lots of scheduled passes there should be more than enough air time to get everyone worked that wants it, but use some common sense. If you have linear capability, find us on one of those birds, and leave SO-50 for the FM only operators. If you're on the West coast and can work us on a higher pass where the east coast doesn't have a footprint, consider delaying to give them a chance. If you can handle taking a night off from using SO-50 as your ragchew repeater in the sky, that'd be great too... and please try to keep the dupes to a minimum - you never know when someone is just sliding into the footprint and only has 30 seconds to make that precious QSO. Thanks in advance.

Finally, we're planning to do a very informal round table on 20 meters Saturday night at 8:00 PDT. Clayton, W5PFG has agreed to find us a frequency (probably the upper portion of 20m) and send out a tweet on where we will be. We'd love to have you stop by on HF and chat about Satellite stuff, the expedition, or "Am I in the log?" that night.

It's expedition go time. Hope to catch everyone from CM93!

[ANS thanks Dave, KG5CCI for the above information]

/EX

In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
Joe Spier, K6WAO
k6wao at amsat dot org